

ABSTRACT OF THE DISCLOSURE

Fabrication of a quantum dot functional structure having ultra-fine particles homogeneously distributed in a transparent medium includes depositing such particles having a single particle diameter and uniform structure onto a substrate with the transparent medium. An apparatus for fabricating a quantum dot functional structure comprises: a generating chamber for generating high-purity ultra-fine particles by exciting a semiconductor target with pulsed laser light in low-pressure rare gas, and then allowing the semiconductor target to be detached or ejected by ablation and condensed and grown in the gas; a particle classifying chamber for classifying the ultra-fine particles; a depositing chamber for depositing the high-purity semiconductor ultra-fine particles and the transparent medium by exciting a transparent medium target with excimer laser light simultaneously or alternately when the particles are collected onto the substrate, and by collecting the substance generated through ablation onto the substrate; and a carrier gas exhaust system.